EXHIBIT C

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TR 72575
Issue 1, October 1996

Bell Atlantic Technical Reference

Digital Unbundled Loop Services Technical Specifications

Bell Atlantic Network Services, Inc.
Technical Reference

TR-72575
Issue 1, October 1996

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1. General

1.01 This technical reference provides the technical specifications associated with the Digital Unbundled Loop Services offered by Bell Atlantic (BA) in the co-carrier section of local exchange tariffs. All of the services described in this document may not be available in every jurisdiction.

1.02 Whenever this technical reference is reissued, the reason(s) for reissue will be provided in this paragraph.

1.03 Digital unbundled loop services enable Other Telephone Companies (OTC) that are co-located in a BA Central Office to connect to BA subscriber loops that are designed to support digital services including Integrated Services Digital Network (ISDN) services.

1.04 The following digital unbundled loop services are defined: ISDN Basic Rate and DS1. HDSL and ADSL unbundled loop services are under study.

1.05 The technical specifications in this document assume that the OTC is co-located in the same CO as the digital unbundled loop service. In the future, BA may offer transport services for digital unbundled loop services. In that case, the technical specifications associated with the transport service should be consulted.

2. Service Description

A. General

2.01 The description, terms and conditions, rates, regulations, and Universal Service Order Codes (USOCs) for digital unbundled loop services are contained in applicable tariffs or contracts.

2.02 Digital unbundled loop services are provided subject to availability on a first-come first-served basis. Special construction charges apply when appropriate facilities are not available.

2.03 Digital unbundled loop services provide the OTC with a transmission channel suitable for the transport of certain digital services. The channel is between the Central Office Distributing Frame (CODF) or DSX-1 termination of OTC equipment in a BA Central Office (CO) and the Rate Demarcation Point (RDP) at an End User (EU) customer location.

B. ISDN Basic Rate Unbundled Loop Service (IBRULS)

2.04 IBRULS provides the OTC with an effective 2-wire channel that is suitable for the transport of 160 kbps digital signals in both directions simultaneously using the 2B1Q line code.

2.05 The interface at the OTC CODF termination is 2-wire and the interface at the EU-RDP is 2-wire. At each interface one conductor is called tip and the other conductor is called ring.

2.06 The transmission channel between the IBRULS 2-wire interfaces is effective 2-wire. An effective 2-wire channel may be entirely 2-wire or it may contain a 4-wire facility portion (such as a Digital Loop Carrier) with a 2-wire metallic extension to the EU-RDP. A typical IBRULS configuration is shown in Figure 2-1.

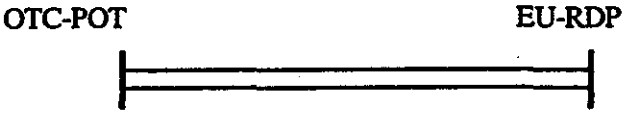

Figure 2-1: Typical 2-Wire IBRULS configuration

2.07 IBRULS supports full duplex 160 kbps digital transmission. The 160 kbps ISDN Basic Rate supports a 16 kbps overhead channel for performance monitoring, framing, synchronization, and maintenance. In addition, the line rate supports 144 kbps of payload data which is divided into three channels, two 64 kbps "B" (Bearer) channels and one 16 kbps "D" (Data) channel.

2.08 IBRULS supports the standard ISDN Basic Rate Two-Binary One-Quaternary (2B1Q) line code. Vendor-specific, non-standard line codes are not supported and Bell Atlantic spectrum management rules do not permit their deployment.

2.09 IBRULS may be provided using a variety of loop transmission technologies, including but not limited to, metallic cable, metallic cable based digital loop carrier, and fiber optic digital loop carrier systems.

2.10 When digital loop carrier (DLC) is used to provide IBRULS, the DLC will provide an ISDN Basic Rate interface at the RDP that meets the network requirements in ANSI T1.601-1992 [1].

2.11 It is currently known that the 2B1Q line code is incompatible with a number of embedded services. These services include CO-LAN, 15 kHz Program Audio Service, and analog carrier systems.

2.12 Analog carrier systems are extremely susceptible to interference from the 2B1Q line code and separation into separate cable sheaths is required.

2.13 Program audio services are also susceptible to interference from the 2B1Q line code on the loop. In order for the program audio and the IBRULS services to coexist, binder group separation is necessary. Separation to non-adjacent binder groups is preferred but adjacent binder groups may provide adequate margin.

2.14 Data-Voice Multiplexers (DVM) are also incompatible with IBRULS depending upon the range at which the DVMs are deployed. If DVMs are operated at less than 80% of the manufacturer's maximum specified range, including CO and customer wiring, they may be compatible with the 2B1Q line code. If DVMs are operated at or above the 80% range and occupy

the same cable sheath as a 2B1Q service, then the two services are considered to be incompatible. In this case binder group separation is necessary. If this is not possible, an alternate means of providing the 2B1Q service must be sought.

2.15 IBRULS utilizes subscriber loop facilities that were originally designed for Plain Ordinary (analog) Telephone Service (POTS). For this reason, some loops, such as loaded metallic facilities or analog carrier systems, may not be suitable for IBRULS.

2.16 Bell Atlantic will work with the OTC to resolve facility problems should the IBRULS loop facility require enhancement equipment to support BRI service.

2.17 If an OTC service is provided using IBRULS and electronic transmission enhancement equipment is required to meet OTC requirements that are more stringent than IBRULS and Basic Rate ISDN, the OTC will be responsible for providing such enhancement equipment.

C. DS1 (1.544 Mbps) Unbundled Loop Service (DS1ULS)

2.18 DS1ULS provides the OTC with a 4-wire transmission channel that is suitable for the transport of 1.544 Mbps (DS1) digital signals in both directions simultaneously.

2.19 The interface at the OTC DSX-1 termination in the BA CO is 4-wire and the interface at the EU-RDP is 4-wire. The conductors of the OTC or EU transmit pair are called tip and ring and the conductors of the OTC or EU receive pair are called tip 1 and ring 1.

2.20 The transmission channel between the DS1ULS interfaces consists of 4-wire facilities. DS1ULS may be provided using a variety of loop transmission technologies, including but not limited to, metallic cable, metallic cable with regenerators, metallic cable with High-Bit-Rate Digital Subscriber Line (HDSL) technology, or fiber optic transport systems. A typical DS1ULS configuration is shown in Figure 2-2.

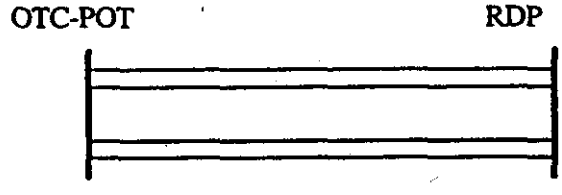

Figure 2-2: Typical 4-Wire DS1ULS configuration

2.21 DS1ULS enables full duplex 1.544 Mbps digital transmission. The 1.544 Mbps line rate supports an 8 kbps framing format and 1.536 Mbps of payload data. DS1ULS will support either the Superframe (SF) or Extended Superframe (ESF) framing formats as specified in ANSI T1.403-1995 [4].

2.22 DS1ULS is available with either the AMI or B8ZS line codes as specified in ANSI T1.403-1995 [4].

2.23 DS1ULS shall provide an electrical DS1 interface at the RDP that meets the network requirements in *ANSI T1.403-1995* [4].

2.24 The DS1 interface provided by BA does not deliver direct-current power to the NI via the simplex leads of the transmit and receive pairs. When BA employs metallic facilities and no loopback device is deployed, direct-current power could appear at the NI on the simplex leads of the transmit and receive pairs however. In such cases, the OTC or EU equipment shall provide a direct-current connection between the simplexes of the transmit and receive pairs.

2.25 Direct-current power shall not be delivered to the EU-POT by customer equipment. In addition, customer equipment shall not apply voltages to the EU-POT other than those described in ANSI T1.403-1995.

2.26 The OTC will be responsible for providing synchronization timing for the DS1ULS.

2.27 Subscriber loop facilities were originally designed for Plain Ordinary (analog) Telephone Service (POTS). For this reason, some loops may not be suitable for DS1ULS.

D. High-Bit-Rate Digital Subscriber Line Unbundled Loop Service (HDULS)

2.28 HDULS is under study.

E. Asymmetrical Digital Subscriber Line (ADSL) Unbundled Loop Service

2.29 ADSL Unbundled Loop Service (ADULS) is under study.

F. Service Elements

2.30 IBRULS ordinarily consists of two elements:

(1) The CODF wire and tie cable(s) between the CODF termination of the co-located OTC equipment and the CODF termination of a subscriber loop; and,

(2) a subscriber loop facility between the CO and the EU-RDP. The loop is either:

(a) a metallic non-loaded facility consisting of cable and wire between the CODF and the RDP wire with no intermediate electronics; or,

(b) a metallic non-loaded facility consisting of cable and wire between the CODF and the RDP wire with transmission enhancement equipment; or,

(c) a universal digital loop carrier (DLC) facility with 2B+1D ISDN Basic Rate transport capability via three DS0 channels. The DLC facility consists of:

- CO cabling between the CODF and a DLC Central Office Terminal (COT) equipped with an ISDN Basic Rate Interface Terminal Equipment (BRITE) channel unit with NT functionality;

- a fiber or metallic facility from the DLC COT to the DLC Remote Terminal (RT) equipped with an ISDN BRITE channel unit with LT functionality; and,

- cable and wire between the DLC RT and the RDP.

2.31 DS1ULS ordinarily consist of two elements:

(1) The DSX-1 wire and repeatered tie cable(s) between the DSX-1 termination of the co-located OTC equipment and the DSX-1 termination of subscriber loop facilities; and

(2) a subscriber loop facility between the CO and the EU-RDP. The loop is either:

(a) a metallic non-loaded facility consisting of cable and wire between the CODF and the RDP wire with no intermediate electronics; or,

(b) a metallic non-loaded facility consisting of cable and wire between the CODF and the RDP wire with transmission enhancement equipment such as regenerators or DSL technology; or,

(c) a fiber facility from the CO to a Remote Terminal (RT) location with cable and wire between the DLC RT and the RDP.

2.32 HDULS is under study.

2.33 ADULS is under study.

3. Element Specifications

A. General

3.01 Two elements are always used with digital unbundled loop services. They are: CODF wire and tie cable(s), and subscriber loop facilities. A third element, electronic transmission enhancement equipment, is sometimes used with digital unbundled loop services. The following sections contain the specifications for each of these elements.

B. CODF Wiring and Tie Cable(s)

3.02 CODF cross-connect wiring and tie cable(s) are used to link the CODF termination of co-located OTC equipment to the CODF termination of metallic subscriber loops, DLC COTs, and electronic transmission enhancement equipment.

3.03 The total combined length of all CODF cross-connect wiring and all CODF-to-CODF tie cables between the CODF termination of the OTC equipment and the CODF termination of any subscriber loop in the same CO should be less than 1500 feet. No bridged tap is permitted in the CO.

3.04 The direct-current resistance between the CODF termination of the OTC equipment and the CODF termination of any subscriber loop in the same CO should be less than 80 ohms. This is equal to 1500 or less feet of 24 gauge cable.

3.05 The 1 kHz loss measured on the CODF wiring and tie cables when measured between 900 ohm impedances should be .85 dB or less.

C. Subscriber Loop Facilities

3.07 Subscriber loop facilities consist of feeder and distribution plant between the CODF and the EU customer's RDP. Feeder plant uses a variety of transmission technologies, including but not limited to, twisted-pair metallic cables, twisted-pair metallic cable based digital loop carrier, and fiber optic based digital loop carrier. Distribution plant usually consists of multipair metallic cables. Additional information about subscriber loops may be found in Bellcore SR-TSV-002275 [2].

3.08 Subscriber loop facilities have been designed on a global basis primarily to accommodate POTS and guarantee that loop transmission loss at 1 kHz is statistically distributed and that no single loop exceeds the signaling range of the CO.

3.09 Prior to 1980, loops were designed using one of the following design plans: Resistance Design (RD), Long Route Design (LRD), or Unigauge Design (UD). From 1980 to 1986, the Modified Resistance Design (MRD), Modified Long Route Design (MLRD), and Concentrated Range Extension with Gain (CREG) plans were applied on a going-forward basis (i.e., retroactive redesign was not implemented). In 1986, the Revised Resistance Design (RRD) plan was applied on a going-forward basis.

3.10 Most metallic loop facilities (98%) were designed using the RD, MRD, or RRD design rules. The RRD design rules currently in use limit the loop resistance to the design range of the CO switch (1300 or 1500 ohms) or 1500 ohms whichever is less. The vast majority of non-loaded loops, designed using these rules, will support IBRULS without the need for additional transmission enhancement.

3.11 An IBRULS qualified metallic loop facility is non-loaded and meets the following ISDN Basic Rate design parameters:

(1) The length shall be 18 kft or less;

(2) The direct-current resistance measured between the CODF and the EU-RDP shall be 1300 ohms or less;

(3) Loaded bridged-tap is not permitted;

(4) Bridged tap is limited to 6 kft;

(5) The 40 kHz loss of a metallic loop facility when measured with a 135 ohm impedance at the CODF and a 135 ohm impedance at the RDP shall be 40.0 dB or less;

(6) Metallic loops with a 40 kHz loss between 40 and 76 dB will require transmission enhancement equipment.

3.12 The leakage resistance between the tip conductor and ground and the ring conductor and ground on an IBRULS metallic loop shall each be greater than 100 K ohms.

3.13 The longitudinal noise or power influence (PI) measured per IEEE Std 743-1984 [3] on an IBRULS metallic loop should be less than 90 dBrnC.

3.14 The longitudinal balance of a metallic IBRULS loop is defined as the longitudinal noise (in dBrnC) minus the C-message noise (in dBrnC). The longitudinal balance shall be >50 dB.

3.15 Qualification for IBRULS, may require the placement of a mid-span repeater or similar device. Bell Atlantic does not place more than one mid-span repeater per loop. If a loop will not operate with one repeater, construction of DLC will be necessary.

3.16 When a metallic IBRULS loop has a mid-span repeater, the metallic facility between the CODF and the mid-span repeater and the metallic facility between the mid-span repeater and the EU-RDP shall each meet the requirements in section 3.11.

3.17 IBRULS will not operate properly on non-staggered twist cable (installed prior to 1923) or on flat ribbon cables, such as those used for some CPE interconnections. Such cable may need to be replaced to accommodate IBRULS.

3.18 The HDULS loop facility is under study.

3.19 The ADULS loop facility is under study.

D. Transmission Enhancement Equipment

3.20 Transmission enhancement equipment is sometimes used with IBRULS. Such equipment can consist of a CO span power module, a mid-span repeater, or BRI extended range system equipment.

3.21 The span power module is located in the CO and provides power to a mid-span repeater. A mid-span repeater regenerates the 2B1Q line code. The repeater has NT functionality that faces the OTC equipment and LT functionality that faces the RDP. A mid-span repeater is deployed when the calculated loss of the non-repeatered loop at 40 kHz (excluding BT) is > 40.0 < 76.0 dB.

3.22 BRI extended range systems consist of a unit located in the CO that has NT functionality and a 2B1Q line code that faces the OTC equipment and a remote unit near the RDP that has LT functionality and delivers a 2B1Q line code to the EU customer. The CO unit uses a line code that is spectrum compatible with BA services. The line code permits operation with a remote unit that is connected via a metallic cable that could have a 40 kHz loss of up to 60 dB.

3.23 The impedance of transmission enhancement equipment shall be a nominal 135 ohms.

3.24 Transmission enhancement equipment shall provide loop current when the RDP is terminated by a direct-current resistance of 135 ohms.

4. Service Specifications

A. General

4.01 Parameters are tested at the RDP in response to trouble reports or when additional testing is purchased.

4.02 Network Channel (NC) and Network Channel Interface (NCI) codes are used for providing channel and interface information to customers. The NC/NCI code set facilitates the identification of network channel requirements and associated interface specifications for services described in tariffs.

4.03 For switched services, the NC code is an encoded representation of the channel that is provided by from the OTC Point Of Termination (POT) to the BA CO. By varying the NC code, the customer is allowed to further specify the type of service.

4.04 The NCI code is an encoded representation used to identify five interface elements located at a POT. The five elements reflect the following physical and electrical characteristics: number of physical conductors, protocol, impedance, protocol options, and transmission levels points (if applicable).

4.05 Examples of the most common NC and NCI codes are given each service described in this section. The complete set of codes may be found in SR-STS-000307 [2].

4.06 Valid NCI code combinations are shown for each service described in this section. Complete NC/NCI compatibility information may be found in SR-STS-000323 [3].

B. IBRULS

4.07 The overall end-to-end IBRULS service is from the CODF termination of the OTC equipment to the EU customer's RDP.

4.08 IBRULS NC code information is shown in Figure 4-1 and IBRULS NCI code combinations are shown in Figure 4-2.

4.09 IBRULS Acceptance Limits (AL) and Immediate Action Limits (IAL) are shown in Table 4-3.

Figure 4-1: IBRULS NC Codes

NC CODE	Character 3	Character 4
UB	-	-

Figure 4-2: IBRULS NCI Code Combinations

OTC-POT	EU-POT
02QC5.OOS	02IS5

Figure 4-3: IBRULS Acceptance Limits (AL) and Immediate Action Limits (IAL)

Parameter	AL	IAL
40 kHz loss	< 40.0 dB	> 42.0 dB
Resistance	< 1300 ohms	> 1300 ohms
Leakage	> 100 kilohms	< 100 kilohms
Power Influence	< 90 dB	> 90 dB

C. DS1ULS

4.10 The overall end-to-end DS1ULS service is from the DSX-1 termination of the OTC equipment to the EU customer's RDP.

4.11 DS1ULS NC code information is shown in Figure 4-8, and DS1ULS NCI code combinations are shown in Figure 4-9.

4.12 DS1ULS performance objectives are shown in Figure 4-10 and DS1ULS test limits are shown in Figure 4-11.

4.13 Availability is a measure of the relative amount of time that a service is "usable" by the customer. Unavailability begins when the Bit Error Ratio (BER) in each second is worse than 10^{-3} for a period of 10 consecutive seconds. The DS1ULS objective is 99.925 percent availability in any twelve consecutive months. Availability equals the total time minus the outage time divided by the total time.

4.14 Accuracy denotes the error performance and is usually specified in terms of errored seconds (ES), or conversely, error-free seconds (EFS). EFS are the primary measure of error performance for DS1ULS. An EFS is any second that an error does not occur.

4.15 A Severely Errored Second (SES) is any one second interval that has a BER of less than (worse than) 10^{3}.

Figure 4-4: DS1ULS NC Codes

NC CODE	Character 3	Character 4
HC	- (SF and AMI)	-
HC	D (ESF and AMI)	-
HC	E (ESF and B8ZS)	-
HC	Z (SF and B8ZS)	-
HC	E (ESF and B8ZS)	I (ISDN PRA)

Figure 4-5: DS1ULS NCI Code Combinations

OTC-POT	EU-POT
04QB9.11	04DU9-BN (SF and AMI)
04QB9.11	04DU9-DN (SF and B8ZS)
04QB9.11	04DU9-1KN (ESF and AMI)
04QB9.11	04DU9-1SN (ESF and B8ZS)

Figure 4-6: DS1ULS Performance Objectives

Parameter	Objective
Accuracy	0.25 % errored seconds long-term (30 days or more)
Availability	99.925 % per year

Figure 4-7: DS1ULS Test Limits

Test Duration	Errored Seconds	Severely Errored Seconds
15 min	0	0
30 min	3	0
45 min	5	2
24 hours	150	7

4.16 Acceptance testing for DS1ULS should be performed with a Quasi Random Signal Source (QRSS), on an OTC-POT to EU-POT basis, using ES performance parameters.

4.17 If BA has installed a loopback device on the DS1ULS, a dispatch for "cooperative testing" will not ordinarily be made and testing will be performed remotely. Normally, a technician will be dispatched by BA in the following instances:

- The DS1ULS is not equipped with a loopback device;
- The loopback device is inoperable;
- Test results do not meet applicable limits;
- The OTC requests a dispatch.

4.18 At the request of the OTC, BA will provide the remote test results to the OTC.

4.19 Other tests may be performed in response to trouble reports or when additional testing is purchased. The 3/24, 1/8, and All Ones patterns are acceptable diagnostic stress tests forDS1ULS when used in accordance with Figure 4-8.

4.20 The patterns in Figure 4-8 may not detect all possible troubles. Additional tests may be required using other patterns designed to detect specific problems (e.g., bridged tap, etc.).

4.21 If errors are detected using the QRSS, 3/24, or 1/8 patterns, it is recommended that the DS1ULS line code options (AMI/B8ZS) be verified using the procedures outlined in the Bell Atlantic Network Services Reference Manual Series 72710 & NS6050. These tests make use of the Framed 2/8 and Framed 1/8 patterns.

Figure 4-8: AMI and B8ZS Test Matrix (1)

TEST PATTERN (2)	TEST DURATION	ACCEPTANCE LIMIT	MAINTENANCE LIMIT
3/24 (AMI only)	5 minutes	7	60
1/8 (B8ZS only)	5 minutes	7	60
All Ones	5 minutes	7	60
QRSS	15 minutes	20	60
Framed All Zeros (3) (B8ZS only)	30 seconds	0	0

Notes:
(1) Test patterns should be framed.

(2) If compatible test equipment is not available to perform these tests, loopback testing should be utilized.

(3) WARNING: This pattern may cause DS1 failures if DS3 equipment is not optioned properly.

D. HDULS

4.22 HDULS service is under study.

E. ADULS

4.25 ADULS service is under study.

5. OTC Equipment and CO Cabling Requirements

A. OTC Equipment Requirements

5.01 Co-located OTC equipment used for interconnection with digital unbundled loop services shall meet all of the applicable generic equipment requirements in Bellcore GR-63-CORE [4] and Bellcore GR-1089-CORE [5].

5.02 Co-located OTC equipment used for interconnection with digital unbundled loop services shall be manufactured in accordance with FCC, NEC, UL, and USDL requirements and orders applicable to Federal, State, and local requirements including, but not limited to, statutes, rules, regulations, orders, or ordinances, or otherwise imposed by law. Requirements that are not specified in this document, contractual technical requirements, or other applicable documents, shall meet the manufacturer's requirements consistent with industry standards.

5.03 The open circuit tip-to-ring dc voltage that co-located OTC equipment applies to BA VF cabling shall be less than 80 Vdc.

5.04 Co-located OTC equipment shall not deliver more than 2.5 watts of power to any load via BA VF cable.

5.05 Co-located OTC equipment shall not deliver more than 150 mA of loop current to any load via BA VF cable.

5.06 The noise limits for digital unbundled loop services require co-located OTC equipment to have a longitudinal balance of >60 dB.

5.07 The loss and noise limits for IBRULS requires co-located OTC equipment to have a nominal impedance of 135 ohms.

5.08 The maximum power level of any transmitted signal on IBRULS shall not exceed ANSI T1.601-1992 [1].

5.09 OTC equipment used with Digital Unbundled Loop Services shall be synchronized to a stratum 1 clock.

5.10 Loops may be exposed to electrical surges from lightning and commercial power system disturbances. Despite protective devices on the CODF, some of these disturbances are likely to reach OTC equipment. OTC equipment shall be designed to withstand certain surges without being damaged, and shall fail in a safe manner under infrequent high stress.

5.11 The prevalent voltage-limiting device available for CO use is the 3-mil carbon block. This device has an upper 3c limiting voltage of 1000 volts peak under surge conditions and 600 volts rms (800 peak) at 60 Hz. OTC equipment connected to digital unbundled loop services with loops protected by carbon blocks may be subjected to voltages up to these levels. Unexposed COs may not have primary protection, and OTC equipment not coordinating with carbon blocks may need protection in these locations.

5.12 If the subscriber loop facility is exposed to commercial ac power, the CO protector may also include 350 mA heat coils for limiting the current that is permitted to flow to CO equipment. In addition, a protective fuse cable located outside the CO incorporating 24 or 26 AWG conductors to coordinate with the protector, serves to limit current to safe levels in the event of prolonged operation of the protector during power fault conditions.

B. OTC Equipment CO Cabling Requirements

5.13 The CO cabling used to terminate OTC equipment on the CODF shall use twisted-pair conductors.

5.14 The type, gauge, and length of the OTC CODF cabling shall be specified based on this specification and OTC equipment requirements. If the specifications in this document differ from the OTC equipment manufacturers specifications, then the more stringent of the two shall be used.

5.15 The direct-current resistance of the CO cabling between the OTC equipment and the CODF shall meet the CO cabling requirements in the Bellcore FR-TSY-000064 [6] (i.e., 23 ohms or less). This is equivalent to 275 feet or less of 26 gauge cable, 440 feet or less of 24 gauge cable, and 700 feet or less of 22 gauge cable.

5.16 All CO cabling between OTC equipment and the CODF shall be connected as specified by the BA CO Engineer.

5.17 The 1kHz loss of the CO cabling between the OTC equipment and the CODF, when measured between 900 ohm impedances, shall be less than .15 dB.

5.18 The C-message noise measured on the CO cabling between the OTC equipment and the CODF shall be 20 dBrnC or less.

6. References

A. Definitions

Asymmetrical Digital Subscriber Line (ADSL)
A system that is capable of transmitting digital signals up to 6 Mbps toward the EU-POT and up to 640 kbps from the EU-POT.

ADSL Unbundled Loop Service (ADULS)
A service that provides an effective 2-wire channel, suitable for the transport of ADSL that uses using Carrierless AM/PM (CAP) technology, between the Bell Atlantic central office distributing frame termination of co-located equipment belonging to an OTC and the rate demarcation point at a customer location.

Basic Rate Integrated Services Digital Network Interface (BRI)
The BRI is a 2-wire ISDN interface that uses the two-binary one-quaternary line code at a 160 kilobit per second rate to transport overhead and up to two B channels and one D channel.

B Channel
The B channel is a 64 kilobit per second channel used for information transfer between users.

Bridged tap
Any branch section of a cable pair, or any extension of a cable pair beyond the point where it is used, in which no direct current flows when customer equipment is connected and used.

Central Office (CO)
A telephone company building which houses equipment and facilities used to provide switched access services.

Central Office Distributing Frame (CODF)
Framework located in a CO that holds wire cross-connects which are used to interconnect cable terminations for EU customer loops, switching system ports, and inter-office facilities.

Channel
An electrical, or photonic communications path between two or more points of transmission.

C-Message Noise
The frequency-weighted, short-term average noise within an idle channel. The frequency weighting, called C-message, is used to account for the variations in 500-type telephone set transducer efficiency and EU annoyance to tones as a function of frequency.

dBm
A unit for expression of power level in decibels relative to one milliwatt.

dBrn
A unit used to express noise power in decibels relative to one picowatt (-90 dBm).

dBm0
A unit used to express power level in decibels relative to one milliwatt referred to, or measured at, a zero transmission level point (0TLP). A unit used to express noise power in decibels relative to one picowatt measured with C-message weighting.

dBrnC0
Noise power in dBrnC referred to, or measured at, a zero transmission level point (0TLP).

D Channel
The D Channel is a 16 kilobit per second packet-switched channel that carries signaling and control for the B channels and also supports customer packet data traffic at speeds up to 9.6 kilobits per second.

Decibel (dB)
The logarithmic unit of signal power ratio most commonly used in telephony. It is used to express the relationship between two signal powers, usually between two acoustic, electric, or optical signals; it is equal to ten times the common logarithm of the ratio of the two signal powers.

Digital Signal Level One (DS1)
A digital signal transmitted at the nominal rate of 1.544 Mbit/s.

Facilities
Any cable, poles, conduit, microwave, or carrier equipment, central office distributing frames, central office switching equipment, computers (both hardware and software), business machines, etc., utilized to provide the services offered by a telephone company.

High-Bit-Rate Digital Subscriber Line (HDSL)
A system that is capable of transmitting bi-directional DS1 (1.544 Mbps) signals or bi-directional half DS1 (768 kbps) signals over metallic twisted-pair cables to provide access to digital telecommunications services.

HDSL Unbundled Loop Service (HDULS)
A service that provides a 2-wire or 4-wire metallic channel, suitable for the transport of HDSL, between the Bell Atlantic central office distributing frame termination of co-located equipment belonging to an OTC and the rate demarcation point at a customer location.

Integrated Services Digital Network (ISDN)
ISDN describes the end-to-end digital telecommunications network architecture which provides for the simultaneous access, transmission , and switching of voice, data, and image services. These functions are provided via channelized transport facilities over a limited number of standard user-network interfaces.

ISDN Basic Rate Unbundled Loop Service (IBRULS)
An unbundled loop service that provides an ISDN basic rate channel between the Bell Atlantic central office distributing frame termination of co-located equipment belonging to an OTC and the rate demarcation point at a customer location.

Leakage
The resistance between the conductors of an insulated metallic pair or the resistance between each conductor of an insulated metallic pair and ground.

Loop
A transmission channel between a EU customer location and a BA CO that is used as a transmission channel for telephone company services.

Other Telephone Company (OTC)
An organization that provides telecommunications services to the public.

Plain Ordinary Telephone Service (POTS)
The basic single line switched access service offered by local exchange carriers to residential and business customers. POTS uses loop-start signaling.

Power Influence (PI)
The power of a longitudinal signal induced in a metallic loop by an electromagnetic field emanating from a conductor or conductors of a power system. PI is also called longitudinal noise or noise-to-ground.

Rate Demarcation Point (RDP)
The point at which Bell Atlantic network access recurring charges and responsibility stop and beyond which customer responsibility begins. The RDP is the point of demarcation and/or interconnection between a Bell Atlantic subscriber loop facility and EU premises cabling or

terminal equipment. Bell Atlantic facilities at, or constituting, the rate demarcation point shall consist of wire or a jack conforming to Subpart F of Part 68 of FCC rules.

Transmission Enhancement Equipment
In general, any equipment that improves the characteristics of a transmitted signal. In this document, transmission enhancement equipment is any equipment that regenerates a digital signal.

Unbundled Loop
A transmission channel between a EU customer location and a LEC CO that is not a part of, or connected to, other LEC services.

Voice Grade (VG)
A term used to describe a channel, circuit, facility, or service that is suitable for the transmission of speech, digital or analog data, or facsimile, generally with a frequency range of about 300 to 3000 Hz.

B. Acronyms

ADSL	Asymmetrical Digital Subscriber Line
ADULS	ADSL Unbundled Loop Service
ANSI	American National Standards Institute
BA	Bell Atlantic
BRI	Basic Rate Interface
BRITE	Basic Rate Interface Terminal Equipment
CO	Central Office
CODF	Central Office Distributing Frame
COT	Central Office Terminal
DLC	Digital Loop Carrier
DS0	Digital Signal Level Zero
DS1	Digital Signal Level One
DVM	Data-Voice Multiplexer
HDSL	High-Bit-Rate Digital Subscriber Line
HDULS	High-Bit-Rate Digital Unbundled Loop Service
IBRULS	ISDN Basic Rate Unbundled Loop Service
ISDN	Integrated Services Digital Network
LT	Line Terminating
NT	Network Terminating
OTC	Other Telephone Company
PI	Power Influence
POTS	Plain Ordinary Telephone Service
RD	Resistance Design
RDP	Rate Demarcation Point
RT	Remote Terminal
USOC	Universal Service Order Code

VF	Voice Frequency
VG	Voice Grade
2B1Q	Two-Bit One-Quaternary

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NOTE: These documents are subject to change; references reflect the most current information available at the time of printing. Readers are advised to check the status and availability of all documents.